Enabling Technology for Microgravity Research

Information		
Name:		
Organization/Company:		
Street:		
City:		
State:		
Zip Code:		
Country:		
Phone Number:		
Fax Number:		
E-mail address:		
Enterprise you support:	Earth Science Space Science Aerospace Technology	Biological and Physical Research Space Flight Education
OBPR Respondees Only: Which one do you support?	Physical Science Research Biological Science Research Research Partnerships and Flight support	

	What is the nature of your organization? (check all that apply)
	NASA
	Academia/Space Institute
	Commercial/Space Product Development
	Military/ Aerospace prime contractors
	Military/ Aerospace subcontractors
	Military/ Aerospace integrator of finished electronic systems
	Manufacturer of finished electronic/software products for use by government or industry
	Manufacturer of electronic subassemblies or major system components for use by military/aerospace industry
	DOD, Army, Navy or Air Force facility
	Research & development agency or facility
	FAA or other non-DOD government aeronautics agency or facility
	Other (please specify)

Microgravity Space Flight Experience: (check all that apply)

ISS	Ground NRA Program
SpaceLab	Weather Balloons
SpaceHab	MIR
Shuttle/Shuttle Middeck and platforms	Telescopes
Free Flyer	LDEF
Sounding Rockets	Interplanetary Missions (e.g., Mars Rover, Viking, Pioneer)
Hitch Hiker	Apollo Program
Gas Can	Expendable Vehicle Programs
KC 135	Satellites
Drop Tower	Other/Commentary
International Partner collaborations (e.g., Canada, ESA, Japan, Brazil)	

Your Primary Function? (check all that apply)

Engineering
Principal Investigator
Co-Investigator
Hardware design/integration
Software development/integration
Systems integration
Research & development
Manufacturing/production
Test/ evaluation/ reliability/ quality control
Other engineering (please specify)

Engineering Management
Principal Investigator
Co-Investigator
Hardware design/integration management
Software development/integration management
Systems integration management
Research & development management
Manufacturing/production management
Test/ evaluation/ reliability/ QC management
Other engineering management (please specify)

Executive Management
Corporate/ command/ operations management
Program/project management
Procurement/purchasing management
Government/legislative management
Other management (please specify)

Support
Principal Investigator
Co-Investigator
Engineering/ test/ research/ service
Program/project administration
Procurement/purchasing
Government/legislative
Other (please specify)

Academia/Space Institute
Principal Investigator
Co-Investigator
Student
Contractor
Technician
Other (please specify)

Questions

1a. Select all applicable technology arenas, which can lead to solutions with present and future problems in your project:

Lab-on-chip Robotics technology Nanotechnology (e.g., sensors, motors, actuators, conductive polymers, nanotubes, etc.) Optical communication High-speed data acquisition/transfer (e.g., custom built modem) Wireless technology Smart Sensor technology (e.g., STIM, NCAP, TEDS, etc.)	AI driven technology (e.g., data mining, fault tolerant, planning and scheduling, optimization) Ultra Low power CMOS technology (i.e., *complementary metal oxide semiconductor*) Data Compression/Decompression technology Smart Structures and Materials Bio-sensors/Bio-robots/Bio-mimetics Combination of all Other technology/Commentary to above

1b. Is an innovative solution or methodology to your project/problem being pursued? If so, which are areas applied?

Control (e.g., adaptive, feedback, neural networks, etc.) Planning and Scheduling Process (physical, chemical, biological) Fault tolerant analysis Identification/Prediction Communication (e.g., optics, wireless, real-time computing, security, AI, etc.) Data Storage/Retrieval (e.g., data mining, databases, etc.)	Sensing (e.g., smart, intelligent sensors, position, proximity, etc.) Miniaturization (e.g., embedded, firmware, ASIC, etc.) Automation (e.g., robotics, MEMS, micro-machines, etc.) Software engineering (e.g., collaborative systems, AI based systems, etc.) Rapid Prototyping Radiation Protection Other innovations/Commentary to above

2. After reading and understanding the overview associated with this "Enabling Technology for Code UG" task, are there fleet crossing technologies that you are currently engaged in that could benefit other payload developers? Please describe or provide details.

3. Do you have a spaceflight success story for the inclusion of a Commercial Off-the-Shelf (COTS) component or system that allowed improvements in the areas of payload performance, sizing, schedule, or cost? Please describe or provide details.

4. Inclusion of COTS is usually done to allow for improvements into a payload development cycle. Please list issues or lessons learned that arise when using (or attempting to use) COTS hardware devices or software.

5. Identify and provide a short description of issues that would arise in your payload development, if complete automation (e.g., a free flyer space-based platform, autonomous operation on ISS, etc.) is required.

6. With respect to the previous question, identify and provide a short description, of other payload issues that are not related to automation.

7. What potential system, component, or subcomponent developments are there that may resolve the above issues?

8. List and describe software-related issues in your area that are a major deterrent to the success of your project or program.

9. Identify issues that could potentially be resolved with the use of software that is currently unavailable.

10. For miniaturization purposes, would you replace software with dedicated hardware like embedded chips and/or evolvable hardware (e.g., firmware, lab on chip, adaptive controller, nanotechnology, etc.)? Please describe.
11. In your experience, what hardware development has required attendent software development?
12. As a result of manifest adjustments to Shuttle flight schedules, are there retrofit activities associated with your payload or rack project that take advantage of technology, which is either emerging or more current than the original design? If so, please describe.
13. Do you have any special technology research assessment activities (e.g., Center Director's Discretionary Funds, SBIR, STTR, NRA, other government agency research) not currently available for review that you would be willing to share with others? Please describe or provide details.
14. What research and technology development is required to reduce the up-mass, volume and power of the next generation of autonomous spacecraft subsystems?
15. What research and technology development is needed to improve automated sensing and autonomous controls for microgravity payloads to allow optimal performance?
16. Is there a keynote speaker or presenter that you would recommend that can talk about a relevant, emerging technology at our workshop?
17. In the event that an 'Enabling Technology for Code UG' workshop is held, would you like to be a participant? Workshop products will include a priority listing of technologies that could provide a positive impact to existing and future research development approaches, and the methodology to pursue the maturation of technology readiness.
Yes No
Information provided in the survey is for internal NASA use only and will not be provided for public release

If you would like to send additional information, references, reports or presentations, please email Karen Murphy (Karen.L.Murphy@msfc.nasa.gov)